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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

TECHNICAL MEMORANDUM 129

TEST OF SPECIMEN OF WOOD OF LONGERONS OF THE S.E.5 AIRPLANE
AFTER SEVEN YEARS' SERVICE.

By Bureau of Standards.

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Memorial Aeronautical
Laboratory.

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August, 1922.



TEST OF SPECIMEN OF WOOD OF LONGERONS OF THE S.E.5 AIRPLANE
AFTER SEVEN YEARS' SERVICE.

By Bureau of Standards.

A specimen of wood taken from one of the longerons of the S.E.5 airplane was submitted for physical tests by the National Advisory Committee for Aeronautics. The S.E.5 airplane had been in service approximately seven years before failure of the longeron, during a landing.

A transverse test was made of the wood sample using a 5,000 pound Olsen testing machine, the deflection under load being measured by means of a Wissler dial.

The results of the transverse test are given in Table 1, the stress-strain curve is attached.

There are two curves plotted on the curve sheet due to the fact that there was not enough clearance in the machine to allow the specimen to be tested to rupture at the time of making the first test, therefore the specimen had to be taken out and the machine readjusted before the test could be carried to completion. Curve 1 represents the data obtained from the first test and Curve 2 the retest. The physical properties of the wood are computed from both tests. Curve 2 shows a lower proportional limit and ultimate strength than curve 1. It is evident that the first test overstrained the material, nevertheless the strength of the wood as computed from the lower value of the second test (retest) is about equal to that specified in U. S. Army Air Service specifica-

tion 15020-C. On the first test, which we consider the better, the values are greater than those given in the Air Service Specifications.

TABLE 1.
Transverse Test of Airplane Wood.
Span 16 Inches.

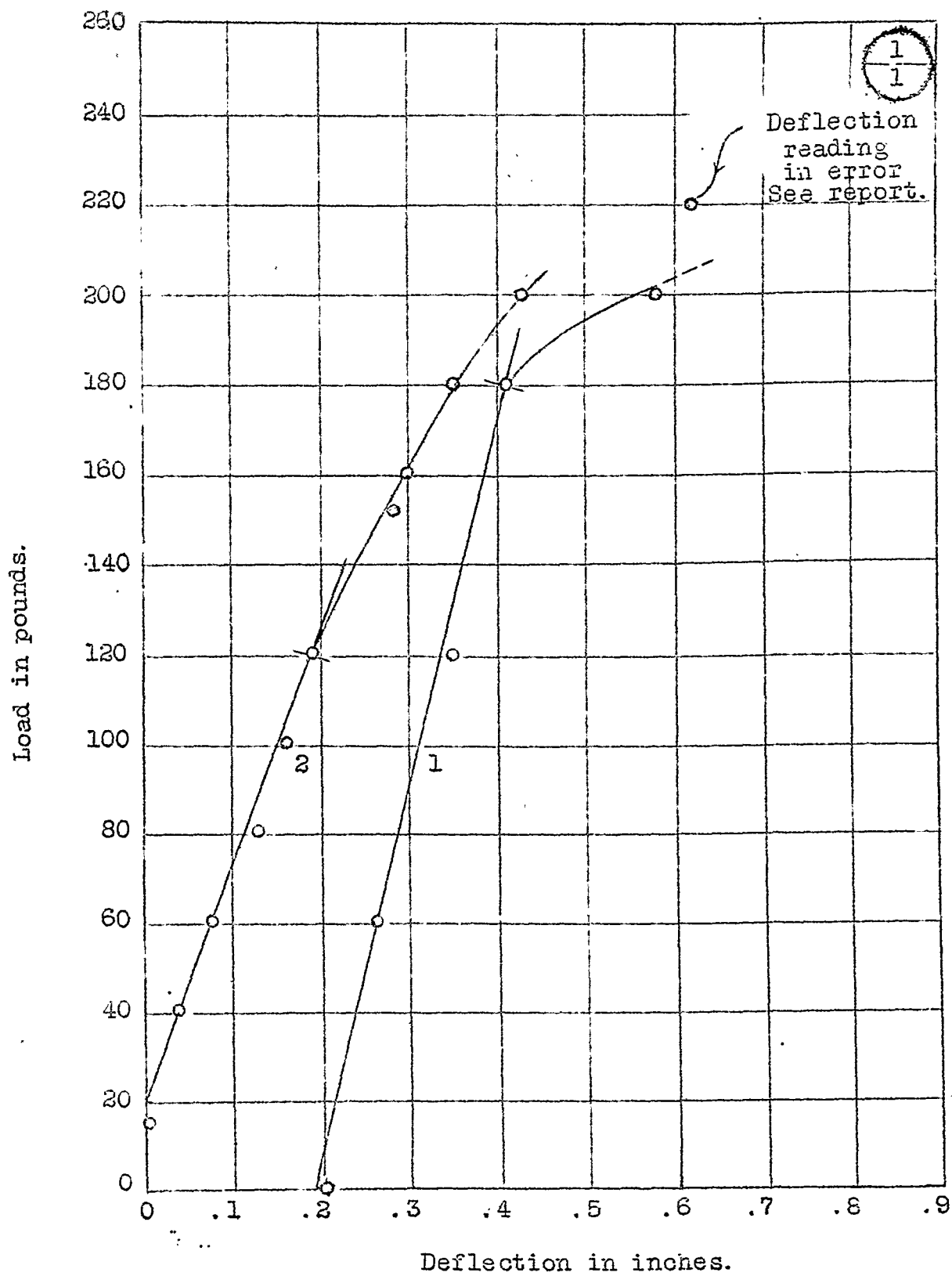
		Curve 1	Curve 2	Air Service Spec. 15020-C
Dimensions	inches	:0.615 x 1.034:0.615 x 1.034:		
Fiber stress at Elastic Limit	lb/sq. in.	6570	4380	5100
Mod. of Rup- ture.	lb/sq. in.	8030	7300	7900
Mod. of Elas- ticity.	lb/sq. in.	1,270,000	803,000	1,300,000

Two samples were taken from the transverse test specimen for moisture content determination. The samples, after having been cut to a proper size and shape and weighed, were placed in an oven maintained at 100 degrees centigrade and weighed at 24-hour intervals until a variation in weight, for a 24-hour interval, was less than 0.5 per cent.

The percentage of moisture was then determined and specific gravity computed upon weight and volume of the oven-dry samples. The results of this test are reported in Table 2.

TABLE 2.
Moisture Content and Specific Gravity
Determination of Airplane Wood.

Spec. No.	Moisture Content Percent	Specific Gravity	Weight per cubic foot. Pounds
A	11.28	0.35	21.85
B	10.96	.35	21.85
Spec. 15002-D		.36	



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